

CLAIMS

What is claimed is:

5 1. A method by which a router ensures the uniqueness of an identifier used to identify the router in routing protocol messages (RPMs) originated by the router in a network, comprising:

for each of a plurality of routing protocol messages (RPMs) received by the router, determining whether an identifier ID_R in the received RPM is the same as an identifier ID_S currently used by the router to identify itself in RPMs originated by the router;

10 comparing sequence information in an RPM most recently originated by the router with sequence information in each of a plurality of the received RPMs for which the identifier ID_R is determined to be the same as the identifier ID_S , the result of each comparison indicating whether the received RPM appears to have been originated more recently than the RPM most recently originated by the router;

15 determining whether those RPMs having an identifier ID_R that is the same as the identifier ID_S and appearing to have been originated more recently than the RPM most recently originated by the router are being received at a rate above a predetermined threshold rate; and

20 upon determining that such RPMs are being received at a rate above the predetermined threshold rate, selecting an identifier different from the identifier ID_S for subsequent use in identifying the router in routing protocol messages originated by the router.

25 2. A method according to claim 1, wherein the sequence information in each RPM includes a sequence number, and wherein the sequence numbers in a sequence of RPMs originated by the router change monotonically.

3. A method according to claim 2, wherein the sequence information in each RPM further includes a checksum calculated from predetermined contents of the RPM.

4. A method according to claim 3, wherein each RPM further includes a random number tending to differentiate the RPMs from each other, and wherein the random number is included in the predetermined contents of the RPM from which the checksum is calculated.

5. A method according to claim 3, wherein for each RPM the sequence number forms a more-significant part of the sequence information and the checksum forms a less-significant part of the sequence information.

6. A method according to claim 2, wherein the sequence numbers in the sequence of RPMs originated by the router increase monotonically.

7. A method according to claim 1, wherein the RPMs are link state messages.

8. A router capable of ensuring the uniqueness of an identifier used to identify the router in routing protocol messages (RPMs) originated by the router in a network, the router being operative to:

determine, for each of a plurality of routing protocol messages (RPMs) received by the router, whether an identifier ID_R in the received RPM is the same as an identifier ID_S currently used by the router to identify itself in RPMs originated by the router;

compare sequence information in an RPM most recently originated by the router with sequence information in each of a plurality of the received RPMs for which the identifier ID_R is

determined to be the same as the identifier ID_s, the result of each comparison indicating whether the received RPM appears to have been originated more recently than the RPM most recently originated by the router;

5 determine whether those RPMs having an identifier ID_R that is the same as the identifier ID_s and appearing to have been originated more recently than the RPM most recently originated by the router are being received at a rate above a predetermined threshold rate; and

10 upon determining that such RPMs are being received at a rate above the predetermined threshold rate, select an identifier different from the identifier ID_s for subsequent use in identifying the router in routing protocol messages originated by the router.

9. A computer program product including a computer readable medium, the computer readable medium having a routing program stored thereon, the routing program comprising:

20 program code for determining, for each of a plurality of routing protocol messages (RPMs) received by the router, whether an identifier ID_R in the received RPM is the same as an identifier ID_s currently used by the router to identify itself in RPMs originated by the router;

25 program code for comparing sequence information in an RPM most recently originated by the router with sequence information in each of a plurality of the received RPMs for which the identifier ID_R is determined to be the same as the identifier ID_s, the result of each comparison indicating whether the received RPM appears to have been originated more recently than the RPM most recently originated by the router;

30 program code for determining whether those RPMs having an identifier ID_R that is the same as the identifier ID_s and appearing to have been originated more recently than the RPM most recently originated by the router are being received at a rate above a

predetermined threshold rate; and

program code for selecting, upon determining that such RPMs are being received at a rate above the predetermined threshold rate, an identifier different from the identifier ID_s for subsequent use in identifying the router in routing protocol messages originated by the router.

10. A computer data signal including a routing program for execution in a computer functioning as a router in a network, the routing program comprising:

program code for determining, for each of a plurality of routing protocol messages (RPMs) received by the router, whether an identifier ID_R in the received RPM is the same as an identifier ID_s currently used by the router to identify itself in RPMs originated by the router;

program code for comparing sequence information in an RPM most recently originated by the router with sequence information in each of a plurality of the received RPMs for which the identifier ID_R is determined to be the same as the identifier ID_s , the result of each comparison indicating whether the received RPM appears to have been originated more recently than the RPM most recently originated by the router;

program code for determining whether those RPMs having an identifier ID_R that is the same as the identifier ID_s and appearing to have been originated more recently than the RPM most recently originated by the router are being received at a rate above a predetermined threshold rate; and

program code for selecting, upon determining that such RPMs are being received at a rate above the predetermined threshold rate, an identifier different from the identifier ID_s for subsequent use in identifying the router in routing protocol messages originated by the router.

11. A router capable of ensuring the uniqueness of an identifier used to identify the router in routing protocol messages (RPMs) originated by the router in a network, comprising:

means for determining, for each of a plurality of routing protocol messages (RPMs) received by the router, whether an identifier ID_R in the received RPM is the same as an identifier ID_S currently used by the router to identify itself in RPMs originated by the router;

means for comparing sequence information in an RPM most recently originated by the router with sequence information in each of a plurality of the received RPMs for which the identifier ID_R is determined to be the same as the identifier ID_S , the result of each comparison indicating whether the received RPM appears to have been originated more recently than the RPM most recently originated by the router;

means for determining whether those RPMs having an identifier ID_R that is the same as the identifier ID_S and appearing to have been originated more recently than the RPM most recently originated by the router are being received at a rate above a predetermined threshold rate; and

means for selecting, upon determining that such RPMs are being received at a rate above the predetermined threshold rate, an identifier different from the identifier ID_S for subsequent use in identifying the router in routing protocol messages originated by the router.